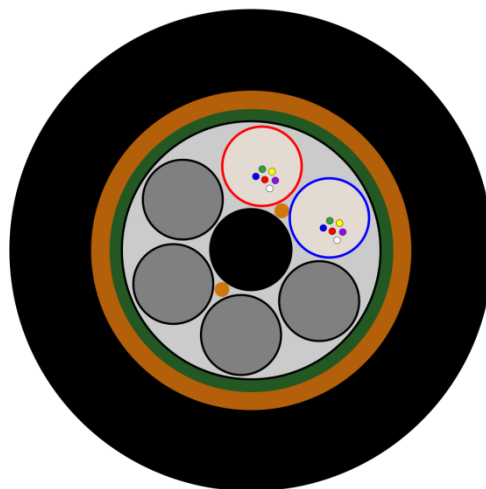


## Outdoor Fiber Optic Cable

Type: OPUG 12/M6 G652D NA SJ MDPE 2.5kN D9



### Application

For outdoor installation, in ducts  
Fully dielectric cable  
~ IEC 60793-1 - Optical fiber Part 1: Generic specifications  
~ IEC 60793-2 - Optical fiber Part 2: Product specifications  
~ IEC 60794-1-2 - Basic optical cable test procedures  
~ ITU-T G.652 - Characteristics of a single-mode optical fiber cable

### Cable Construction

~ **Central Strength Member (CSM)**- Fiber reinforced plastic rod (FRP);  
~ **PBT Loose Tube** filled with a suitable water tightness compound;  
~ **Optical Fibers**;  
~ **Filler(s)** if needed;  
~ **Longitudinal Water Tightness**: dry core with water swellable elements (water blocking yarns and tape);  
~ **Aramid Yarns**;  
~ **Outer Jacket** (Black MDPE);

**Stranding**: Loose tube and fillers, SZ stranded around CSM;

## Technical Characteristics

Optical Fiber Performance - G.652D	
Characteristic	Specified Value
Attenuation Coefficient: at 1310 nm Max :	$\leq 0.35$ dB/km

at 1550 nm Max :	$\leq 0.22$ dB/km
Chromatic Dispersion: between 1285 - 1330 nm: at 1550nm	$\leq 3.5$ ps/nm·km $\leq 18$ ps/nm·km
Attenuation Non-uniformity at 1310 nm at 1550 nm	$\leq 0.03$ dB $\leq 0.03$ dB
Point Discontinuity: at 1310&1550 nm	$\leq 0.1$ dB
Polarization Mode Dispersion (PMD) PMD Q value	$\leq 0.2$ ps/ $\sqrt{\text{km}}$
The optical fiber core and sheath shall be of the E9 / 125 type. The protective cover must be in direct contact with the surface of the optical fiber to protect it and avoid cracking of the optical fiber	E9 / 125 type
Cable Cut off Wavelength ( $\lambda_{cc}$ )	$\leq 1260$ nm
Mode Field Diameter: at 1310 nm at 1550 nm	$9.2 \pm 0.4 \mu\text{m}$ $10.4 \pm 0.5 \mu\text{m}$
The uniformity attenuation at any projected wavelength	$\leq 0.1$ dB/km
Cladding Diameter	$125 \pm 1.0 \mu\text{m}$
Mode field (Core/clad) concentricity error	$\leq 0.6 \mu\text{m}$
Cladding Non-Circularity	$\leq 1\%$
Coating Diameter	$245 \pm 7 \mu\text{m}$
Core / Cladding Concentricity error	$\leq 0.6 \mu\text{m}$
The increase in attenuation of 100 optical fiber cores wrapped on a 50 mm diameter chuck at 1310 nm: at 1550 nm:	$\leq 0.05$ dB; $\leq 0.05$ dB
Coating-Cladding Concentricity error	$\leq 12 \mu\text{m}$
Proof Test	$\geq 1.0\%$ , 1 sec. $\geq 0.69\text{Gpa}$ (100kpsi)
Temperature Cycling Induced Attenuation: at 1550nm and 1625 nm (-400C to +700C)	0.05dB/km
Macro bending Loss : at 1550nm and 1625 nm (100 turns; $\Phi$ 60 mm)	$\leq 0.1$ dB

Fiber Optic Cable Parameters	
Core Type *	G.652.D
Fiber Count	12
Tube Count	2
Filler Count	4
Cable Diameter (mm)	9.0
Cable Weight (kg/km)	63.5
Allowable Tensile Strength (short-term)	2.5 kN
Crush	1500 N/10cm
Water ingress resistance	1m, 24H, 3 samples
Minimum Bending Radius (Installing)	20 x D
Minimum Bending Radius (Operating)	15 x D
Temperature (Installation)	-10°C ~ +60 °C
Temperature (Transportation and Operation)	-25°C ~ +70 °C
Life Span	>30 yr
Packing	Wooden drum with protection
Delivery Lengths	To be confirmed, ± %5 tolerance
Marking	<OPTIVINE> + <OPUG 12/M6 G652D NA SJ MDPE 2.5kN D9> + <manufacturing date> + <length>

Fiber Color Identification**																
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Color	Green	Red	Blue	Yellow	Grey	Violet	Brown	Orange	White	Black	Pink	Turquoise	Green	Red	Blue	Yellow
													+ BR	+ BR	+ BR	+ BR

Tube Color Identification***																		
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Color	Green	Red	Blue	Yellow	Grey	Violet	Brown	Orange	White	Black	Pink	Turquoise	Green	Red	Blue	Yellow	Grey	Violet
													+ BS	+ BS	+ BS	+ BS	+ BS	+ BS

- \* Other fiber types can be used upon request.
- \*\* When tubes go beyond 12 fibers, the colors repeat but black rings are used to distinguish the fibers.
- \*\*\* When cables go beyond 12 tubes, the colors repeat but black stripes are used to distinguish the tubes.
- \*\*\*\* Customized solutions can be offered upon request.